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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CALEY, MICHAEL H

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/008,370

Applicant(s)

ESKILDSSEN ET AL.

Examiner

Michael H. Caley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated as disclosed on Page 3 0012. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 5-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wong (U.S. Patent No. 5,285,516).

Regarding claim 1, Wong discloses a method of fabricating an optical attenuator comprising the steps of:

- a. arranging a first end of a first optical fiber and a second end of a second optical fiber so that they face one another in close proximity (Column 3 lines 18-19);
- b. laterally offsetting from one another the first and second ends of the optical fibers (Column 3 lines 25-28);
- c. fusing the first end of the first fiber to the second end of the second fiber to create a fusion splice (Column 3 lines 30-43);

- d. measuring attenuation imposed on an optical signal transmitted from the first to the second optical fiber and through the fusion splice to determine an initial deviation in attenuation from a prescribed value (Column 3 lines 44-45);
- e. re-fusing the fusion splice while exerting an axially directed force on the first and second ends of the optical fiber (Column 3 lines 50-55);
- f. repeating step (d) to determine a subsequent deviation in attenuation from the prescribed value (Column 3 lines 55-57);
- g. repeating step (e) to reduce the subsequent deviation in attenuation (Column 3 lines 55-57);
- h. if necessary, repeating steps (f) and (g) until a resulting deviation in attenuation falls within a prescribed tolerance (Column 3 lines 55-57).

Regarding claim 2, Wong discloses the method wherein the initial deviation results in an attenuation that is less than the prescribed value and the axially directed force compresses the first and second ends of the fibers (Column 3 lines 50-57).

Regarding claim 5, Wong discloses the method in which the step of creating a fusion splice is performed by an electric discharge fusion splicer (Column 2 lines 40-42).

Regarding claim 6, Wong discloses the method in which the first and second fibers are single mode fibers (Column 2 lines 20-21).

Regarding claim 7, Wong discloses the method in which the first and second fibers are multimode fibers (Column 2 lines 20-21).

Regarding claims 8 and 9, Wong discloses a fusion splice optical attenuator in accordance with the proposed method (Column 1 lines 39-42).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Gleason et al. (U.S. Patent No. 4,557,557 "Gleason").

Wong discloses all of the proposed limitations except for the method in which the initial deviation results in an attenuation that is greater than the prescribed value and the axially directed force pulls the first and second ends of the fibers apart from one another. Wong discloses the method of applying power to the junction in order to reduce attenuation to a prescribed value. Such a method would inherently provide an axially directed force pulling apart the fused first and second ends of the fibers. This force is manifested in that allowing the fibers to heat excessively would create a complete separation between the joined fibers (Wong: Column 3 lines 35-38). Gleason teaches the method of creating an attenuator by compressing the abutted ends of two fibers to create a deformed lumped optical loss in the molten ends of the fibers (Gleason: Column 3 lines 2-5) while monitoring the optical loss continuously.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied an axially directed force pulling the first and second ends of the fibers apart from one another. Wong discloses as an optimal method of iteratively fusing the fiber attenuator in which the coupled region is allowed to cool before taking an attenuation

measurement, which allows for the most accurate measurement given that the surface tension effects from cooling and other transient effects are allowed to occur. In the method disclosed by Gleason, the measurements are taken before the effects of surface tension are allowed to occur (while the coupled region is still hot), which results in an inaccurate assessment of the final attenuation of the coupler. One would have been motivated to use the method disclosed by Wong in constructing an optical fiber as taught by Gleason in order to achieve the most precise coupling possible. However, unlike the method disclosed by Gleason, such a technique could allow the builder to overshoot the desired attenuation, necessitating the fibers to be pulled apart to reverse the attenuating effect of compressing the fibers. Such a method would have been apparent to one of ordinary skill in the art in light of the iterative heating methodology disclosed by Wong.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Sahinci et al. (U.S. Patent No. 6,478,482 "Sahinci").

Wong discloses all of the proposed limitations except for the prescribed tolerance as less than or equal to ± 0.05 dB. Sahinci teaches an attenuation splicing method and system realizing an accuracy within ± 0.1 dB or better by means of advanced heating control techniques (Column 9 lines 55-61). Sahinci also teaches a preference of axially misaligned fibers over overlapped fiber splicing methodologies (Column 5 lines 20-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have developed a methodology as proposed in which the prescribed tolerance is less than or equal to ± 0.05 dB. Wong discloses an iterative methodology of achieving a desired attenuation in an optical fiber splice by means of heating and applying axial pressure to the bond.

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Sahinci proposes various improvements to the method taught by Wong, such as using a nonoverlapping technique and an improved heating control of the fibers. By applying such improvements to the iterative method as disclosed by Wong, one of ordinary skill in the art could have realized accuracies surpassing the values disclosed by Sahinci. Additionally, the prescribed tolerance may be achieved more easily for specified low amounts of attenuation and by throwing out splices which do not meet the specification.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,742,725 to Longobardi et al. as a fusion splicing method with even spectral response.

U.S. Patent No. 5,897,803 to Zheng et al. as an alternate fusion splicing methodology.

U.S. Patent No. 5,321,790 to Takahashi et al. as an alternate fusion splicing methodology.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (703) 305-7913. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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mhc

March 12, 2003

A handwritten mark, possibly a signature or initials, consisting of a vertical line with a small loop at the top and a horizontal stroke extending to the right.